Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for communicating signals ~~between a first communication device and a second communication device~~ using radio frequency (RF) communication techniques, the method comprising [[steps of]]:

    [[a.]] generating a receive filter matrix from a signal received by a plurality of antennas of ~~the~~ a first communication device from ~~the~~ a second communication device, the receive filter matrix comprised of a plurality of sub-matrices each being a convolution matrix derived from a receive filter sub-vector, wherein each receive filter sub-vector defines complex weights associated with a receive tapped-delay line filter for a corresponding one of the plurality of antennas of the first communication device;

    [[b.]] computing a principal eigenvector of a product of the receive filter matrix and a Hermitian of the receive filter matrix, the principal eigenvector comprised of a plurality of sub-vectors each having a length corresponding to a number of taps of a transmit tapped-delay line filter associated with a corresponding one of the plurality of antennas of the first communication device;

    [[c.]] generating from the plurality of sub-vectors of the principal eigenvector a plurality of transmit filter sub-vectors that form a transmit filter vector, each transmit filter sub-vector associated with a

corresponding one of the plurality of antennas of the first communication device and defining complex weights associated with the transmit tapped-delay line filter for a corresponding one of the plurality of antennas of the first communication device; and

[[d.]] applying the transmit filter vector at the first communication device to a signal to be transmitted from the first communication device to the second communication device.

2. (Currently Amended) The method of claim 1, wherein the [[step of]] generating the plurality of transmit filter sub-vectors comprises equating each transmit filter sub-vector to the corresponding sub-vector of the principal eigenvector.

3. (Currently Amended) The method of claim 1, wherein the [[step of]] generating the transmit filter vector further comprises normalizing each sub-vector of the transmit filter vector so that a total power emitted is divided equally among the plurality of antennas of the first communication device.

4. (Currently Amended) The method of claim 3, wherein the [[step of]] normalizing comprises computing the norm of each of the plurality of sub-vectors of the principal eigenvector and dividing each sub-vector of the principal eigenvector by the norm and by the square root of the number of plurality of antennas of the first communication device.

5. (Currently Amended) The method of claim 1, wherein steps (a) through (e) the generating the receive filter matrix, the computing the principal eigenvector, and the generating the plurality of transmit filter sub-vectors

are performed each time a signal is received at the first communication device from the second communication device to update the transmit filter vector and [[step (d)]] the applying the transmit filter vector is performed with the updated filter vector when subsequently transmitting a signal to the second communication device.

6.   (Currently Amended)   ~~A medium encoded with instructions that, when executed, perform a method comprising the steps of~~ A processor-readable medium encoded with a data structure of instructions for performing functions comprising:

[[a.]]   generating a receive filter matrix from a signal received by a plurality of antennas of a first communication device from a second communication device, the receive filter matrix comprised of a plurality of sub-matrices each being a convolution matrix derived from a receive filter sub-vector, wherein each receive filter sub-vector defines complex weights associated with a receive tapped-delay line filter for a corresponding one of the plurality of antennas of the first communication device;

[[b.]]   computing a principal eigenvector of a product of the receive filter matrix and a Hermitian of the receive filter matrix, the principal eigenvector comprised of a plurality of sub-vectors each having a length corresponding to a number of taps of a transmit tapped-delay line filter associated with a corresponding one of the plurality of antennas of the first communication device;

[[c.]]   generating from the plurality of sub-vectors of the principal eigenvector a plurality of transmit filter sub-vectors that form a transmit filter vector, each transmit filter sub-vector associated with a

corresponding one of the plurality of antennas of the first communication device and defining complex weights associated with the transmit tapped-delay line filter for a corresponding one of the plurality of antennas of the first communication device; and

[[d.]] applying the transmit filter vector at the first communication device to a signal to be transmitted from the first communication device to the second communication device.

7.   (Currently Amended)   The medium of claim 6, wherein the instructions encoded on the medium for performing the <u>function of</u> [[step of]] generating the plurality of transmit filter sub-vectors comprise instructions for equating each transmit filter sub-vector to the corresponding sub-vector of the principal eigenvector.

8.   (Currently Amended)   The medium of claim 6, wherein the instructions encoded on the medium for performing the <u>function of</u> [[step of]] generating the transmit filter sub-vectors further comprise instructions for normalizing each sub-vector of the transmit filter vector so that a total power emitted is divided equally among the plurality of antennas of the first communication device.

9.   (Currently Amended)   The medium of claim 8, wherein the instructions encoded on the medium for performing <u>the function of</u> [[step of]] normalizing comprise instructions that compute the norm of each of the plurality of sub-vectors of the principal eigenvector and divide each sub-vector of the principal eigenvector by the norm and by the square root of the number of plurality of antennas of the first communication device.

10.   (Currently Amended)   The medium of claim 6, and further comprising instructions encoded on the medium that repeat functions of ~~steps (a) through (c)~~ generating the receive filter matrix, the computing the principal eigenvector, and generating the plurality of transmit filter sub-vectors, each time a signal is received at the first communication device from the second communication device to update the transmit filter vector and wherein [[step (d)]] the function of applying the transmit filter vector is performed with the updated transmit filter vector when subsequently transmitting a signal to the second communication device.

11.   (Currently Amended)   The medium of claim 6, wherein the instructions ~~associated with the computations of steps (a) through (d)~~ are implemented by one or more arrays of gates.

12.   (Original)   A baseband signal processing integrated circuit device comprising the one or more arrays of gates of claim 11.

13.   (Currently Amended)   A communication device comprising the baseband signal processing integrated circuit device of claim 12, and further comprising:

[[a.]]   a transmitter coupled to the baseband signal processing integrated circuit and to be coupled to the plurality of antennas to up convert transmit signals generated by the baseband signal processing integrated circuit for transmission via respective ones of the plurality of antennas; and

[[b.]]   a receiver coupled to the baseband signal processing integrated circuit

and to be coupled to the plurality of antennas to down convert signals received by the plurality of antennas and to produce receive signals that are coupled to the baseband signal processing integrated circuit.

14. (Currently Amended)   The medium of claim 6, wherein the instructions are processor readable instructions, that when executed by a processor, cause the processor to perform ~~steps (a) through (d)~~ the generating the receive filter matrix, the computing the principal eigenvector, the generating the plurality of transmit filter sub-vectors, and the applying the transmit filter vector.

15. (Currently Amended)   A semiconductor device comprising a plurality of gates configured to implement:

[[a.]] a plurality of transmit tapped delay-line filters, each associated with a corresponding one of a plurality of antennas;

[[b.]] a plurality of receive tapped delay-line filters, each associated with a corresponding one of the plurality of antennas;

[[c.]] one or more computation blocks that:

[[i.]] generate a receive filter matrix from a signal received by the plurality of antennas of a communication device from another communication device, the receive filter matrix comprised of a plurality of sub-matrices each being a convolution matrix derived from a receive filter sub-vector, wherein each receive filter sub-vector defines complex weights associated with a corresponding receive tapped-delay line filter;

[[ii.]] compute a principal eigenvector of a product of the receive filter matrix and a Hermitian of the receive filter matrix, the principal eigenvector comprised of a plurality of sub-vectors each having a

length corresponding to a number of taps of a corresponding transmit tapped-delay line filter;

[[iii.]] generate from the plurality of sub-vectors of the principal eigenvector a plurality of transmit filter sub-vectors that form a transmit filter vector, each transmit filter sub-vector associated with a corresponding one of the plurality of antennas of the first communication device and defining complex weights associated with a corresponding transmit tapped-delay line filter; and

[[iv.]] apply the transmit filter vector at the communication device to a signal to be transmitted to the other communication device.

16.   (Original)   The semiconductor device of claim 15, wherein the computation blocks generate the plurality of transmit sub-vectors by equating each transmit filter sub-vector to the corresponding sub-vector of the principal eigenvector.

17.   (Original)   The semiconductor device of claim 15, wherein the computation blocks generate the transmit filter sub-vectors by normalizing each sub-vector of the transmit filter vector so that a total power emitted is divided equally among the plurality of antennas of the communication device.

18.   (Original)   The semiconductor device of claim 17, wherein the computation blocks normalize each sub-vector of the transmit filter vector by computing the norm of each of the plurality of sub-vectors of the principal eigenvector and dividing each sub-vector of the principal eigenvector by the norm and by the square root of the number of plurality of antennas of the communication device.

19. (Currently Amended)   The semiconductor device of claim 15, wherein the computation blocks repeat the computations ~~of steps (i) through (iii)~~ that generate the receive filter matrix; that compute the principal eigenvector; and that generate the plurality of transmit filter sub-vectors each time a signal is received at the communication device from the other communication device to update the transmit filter vector, and ~~step (iv)~~ wherein the computation that applies the transmit filter vector is performed with the updated transmit filter vector when subsequently transmitting a signal to the other communication device.

20. (Currently Amended)   A radio communication device comprising the semiconductor device of claim 15, and further comprising:

[[a.]] a plurality of antennas;

[[b.]] a transmitter coupled to the plurality of antennas and to the semiconductor device to up convert transmit signals generated by the semiconductor device for transmission via respective ones of the plurality of antennas; and

[[c.]] a receiver coupled to the plurality of antennas and to the semiconductor device to down convert signals received by the plurality of antennas and produce receive signals that are coupled to the semiconductor device.

21. (Currently Amended)   A method for communicating signals ~~between a first communication device and a second communication device~~ using radio frequency (RF) communication techniques, comprising[[steps of]]:

[[a.]] processing with a transmit filter vector a signal to be transmitted from

[[the]] a first communication device via a plurality of antennas of the first communication device to ~~the~~ a second communication device, the transmit filter vector comprised of a plurality of transmit filter sub-vectors defining one or more complex weights associated with a transmit tapped-delay line filter, each transmit filter sub-vector associated with a corresponding one of the plurality of antennas of the first communication device and having a length corresponding to the number taps of the associated transmit tapped-delay line filter; and

[[b.]] processing with a receive filter matrix a signal received from the second communication device at the plurality of antennas of the first communication, wherein the receive filter matrix comprises a plurality of sub-matrices each being a convolution matrix derived from a receive filter sub-vector, wherein each receive filter sub-vector defines complex weights associated with a receive tapped-delay line filter for a corresponding one of the plurality of antennas of the first communication device; and

[[c.]] computing a principal eigenvector of a product of the receive filter matrix and a Hermitian of the receive filter matrix, the principal eigenvector comprised of a plurality of sub-vectors each having a length corresponding to the number of taps of the transmit tapped-delay line filter of the first communication device.

22.   (Currently Amended)   The method of claim 21, wherein when a [[signals]] signal is received at the plurality of antennas of the first communication device from the second communication device, further comprising ~~the step of~~ :

[[a.]] updating the transmit filter sub-vectors with the plurality of sub-vectors of the principal eigenvector for use when transmitting a signal

to the second communication device.

23. (Currently Amended)   The method of claim 22, ~~wherein the step of computing~~ further ~~comprises~~ comprising:
computing the norm of each of a plurality of sub-vectors of the principal eigenvector and dividing each sub-vector of the principal eigenvector by the norm and by the square root of the number of plurality of antennas of the first communication device so that when the transmit filter vector is applied to a signal to be transmitted, a total power emitted is divided equally among the plurality of antennas of the first communication device.

24. (Currently Amended)   ~~A medium encoded with instructions that, when executed, perform a method comprising the steps of~~ A processor-readable medium encoded with a data structure of instructions for performing functions comprising:
[[a.]] processing with a transmit filter vector a signal to be transmitted from a first communication device via a plurality of antennas of the first communication device to a second communication device, the transmit filter vector comprised of a plurality of transmit filter sub-vectors defining one or more complex weights associated with a transmit tapped-delay line filter, each transmit filter sub-vector associated with a corresponding one of the plurality of antennas of the first communication device and having a length corresponding to the number taps of the associated transmit tapped-delay line filter; ~~and~~
[[b.]] processing with a receive filter matrix a signal received from the second communication device at the plurality of antennas of the first communication, wherein the receive filter matrix comprises a plurality

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of sub-matrices each being a convolution matrix derived from a receive filter sub-vector, wherein each receive filter sub-vector defines complex weights associated with a receive tapped-delay line filter for a corresponding one of the plurality of antennas of the first communication device; and

[[c.]] computing a principal eigenvector of a product of the receive filter matrix and a Hermitian of the receive filter matrix when a signal is received at the plurality of antennas of the first communication device from the second communication device, the principal eigenvector comprised of a plurality of sub-vectors each having a length corresponding to the number of taps of the transmit tapped-delay line filter of the first communication device.

25.　(Currently Amended)　　The medium of claim 24, and further comprising instructions encoded on the medium to further perform a function of steps of:

[[a.]] updating the transmit filter sub-vectors with the plurality of sub-vectors of the principal eigenvector for use when transmitting a signal to the second communication device.

26.　(Currently Amended)　　The medium of claim 25, wherein the instructions encoded on the medium for performing the function of [[step of]] computing a principal eigenvector further comprise instructions for computing the norm of each of a plurality of sub-vectors of the principal eigenvector and dividing each sub-vector of the principal eigenvector by the norm and by the square root of the number of plurality of antennas of the first communication device so that when the transmit filter vector is applied to a signal to be transmitted, a total power emitted is divided equally among the plurality of antennas of the first communication device.

27. (Original)   The medium of claim 24, wherein the instructions are implemented by one or more arrays of gates.

28. (Previously Presented)   A baseband signal processing integrated circuit device comprising the one or more arrays of gates of claim 27.

29. (Currently Amended)   A communication device comprising the baseband signal processing device of claim 28, and further comprising:

[[a.]] a transmitter coupled to the baseband signal processing integrated circuit and to be coupled to the plurality of antennas to up convert transmit signals generated by the baseband signal processing integrated circuit for transmission via respective ones of the plurality of antennas; and

[[b.]] a receiver coupled to the baseband signal processing integrated circuit and to be coupled to the plurality of antennas to down convert signals received by the plurality of antennas and to produce receive signals that are coupled to the baseband signal processing integrated circuit.

30. (Currently Amended)   The medium of claim 24, wherein when the instructions are ~~processor readable instructions that, when~~ executed by a processor, cause the processor to perform ~~steps (a) and (b)~~ the functions of:

processing with the transmit filter vector the signal to be transmitted from the first communication device via the plurality of antennas of the first communication device to the second communication device, the transmit filter vector comprised of the plurality of transmit filter sub-vectors defining one or more complex weights associated with the transmit tapped-delay line filter, each

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transmit filter sub-vector associated with the corresponding one of the plurality of antennas of the first communication device and having the length corresponding to the number taps of the associated transmit tapped-delay line filter; and

processing with the receive filter matrix the signal received from the second communication device at the plurality of antennas of the first communication, wherein the receive filter matrix comprises the plurality of sub-matrices each being the convolution matrix derived from the receive filter sub-vector, wherein each receive filter sub-vector defines complex weights associated with the receive tapped-delay line filter for the corresponding one of the plurality of antennas of the first communication device.

31.   (Currently Amended)   A radio communication device comprising:

[[a.]] N plurality of antennas;

[[b.]] a baseband signal processor that generates transmit signals and that recovers data from receive signals; and

[[c.]] a radio transceiver coupled to the baseband signal processor that up converts the transmit signals for transmission via the N plurality of antennas and down converts signals received by the N plurality of antennas to produce receive signals;

[[d.]] wherein the baseband signal processor:

[[i.]] processes with a transmit filter vector a signal to be transmitted from via the N plurality of antennas to another communication device, the transmit filter vector comprised of a plurality of transmit filter sub-vectors defining one or more complex weights associated with a transmit tapped-delay line filter, each transmit filter sub-vector associated with a corresponding one of the N plurality of antennas and having a length corresponding

to the number taps of the associated transmit tapped-delay line filter;

[[ii.]] processes with a receive filter matrix a signal received at the N plurality of antennas from the other communication device, wherein the receive filter matrix comprises a plurality of sub-matrices each being a convolution matrix derived from a receive filter sub-vector, wherein each receive filter sub-vector defines complex weights associated with a receive tapped-delay line filter for a corresponding one of the N plurality of antennas; and

[[iii.]] computes a principal eigenvector of a product of the from a signal received from the other communication device and a Hermitian of the receive filter matrix, the principal eigenvector comprised of a plurality of sub-vectors each having a length corresponding to the number of taps of the transmit tapped-delay line filter of the radio communication device.

32. (Previously Presented) The radio communication device of claim 31, wherein the baseband signal processor updates the transmit filter sub-vectors with the plurality of sub-vectors of the principal eigenvector for use when transmitting a signal to the other communication device.